Aggregating Distributed Generators

Presentation to

DOE DP & Industrial DG

Quarterly Review Meeting

July 26, 2001

Key Personnel

- NREL TPO: Ben Kroposki
- NYSERDA TPO: James M. Foster
- Electrotek PM: Howard Feibus

Project Goals

- To demonstrate the aggregation of backup generators by adding controls to make them immediately dispatchable from a single control point when required to provide spinning reserve, interruptible load and peak power to the utility grid.

Project Objectives

- Base Year-Develop monitoring/controls; conduct feasibility analyses, and survey backup generators in LIPA territory.
- Option Year 1: Develop, Install and Conduct a Pilot Test; Develop Commercial Design.
- Option Year 2: Procure, Install and Operate a 30 MW commercial aggregation/dispatch service.

Base Year Deliverables

- Report on backup generators
  Done
- Report on design for gen-set connection
  In preparation; August delivery
- **Report on aggregator controls**
  In preparation; August delivery
- Report on cost and benefits
  In preparation; August delivery
- **Report on the design of field test**
  In preparation; August delivery

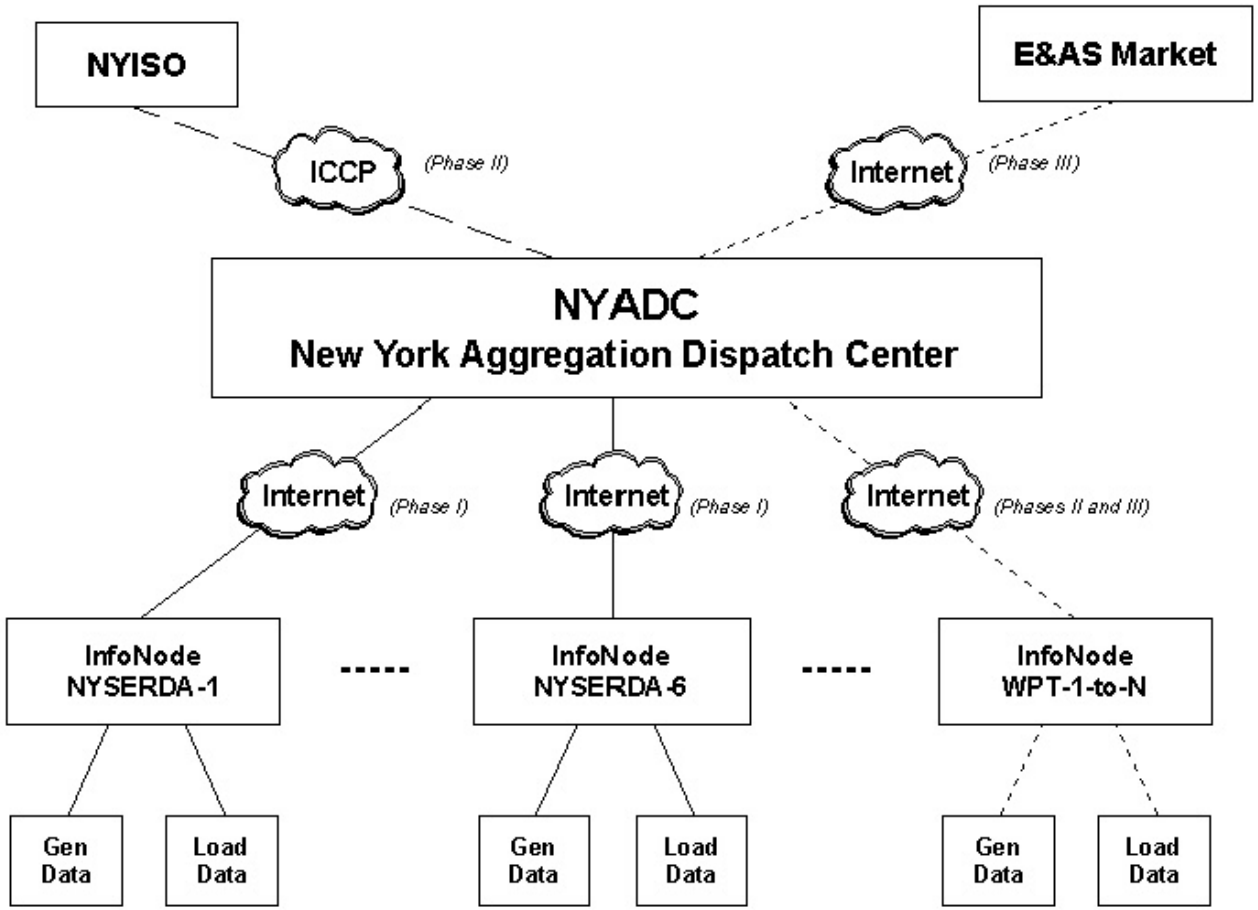
New York Aggregation Dispatch Center

Design Specifications

Prepared by:

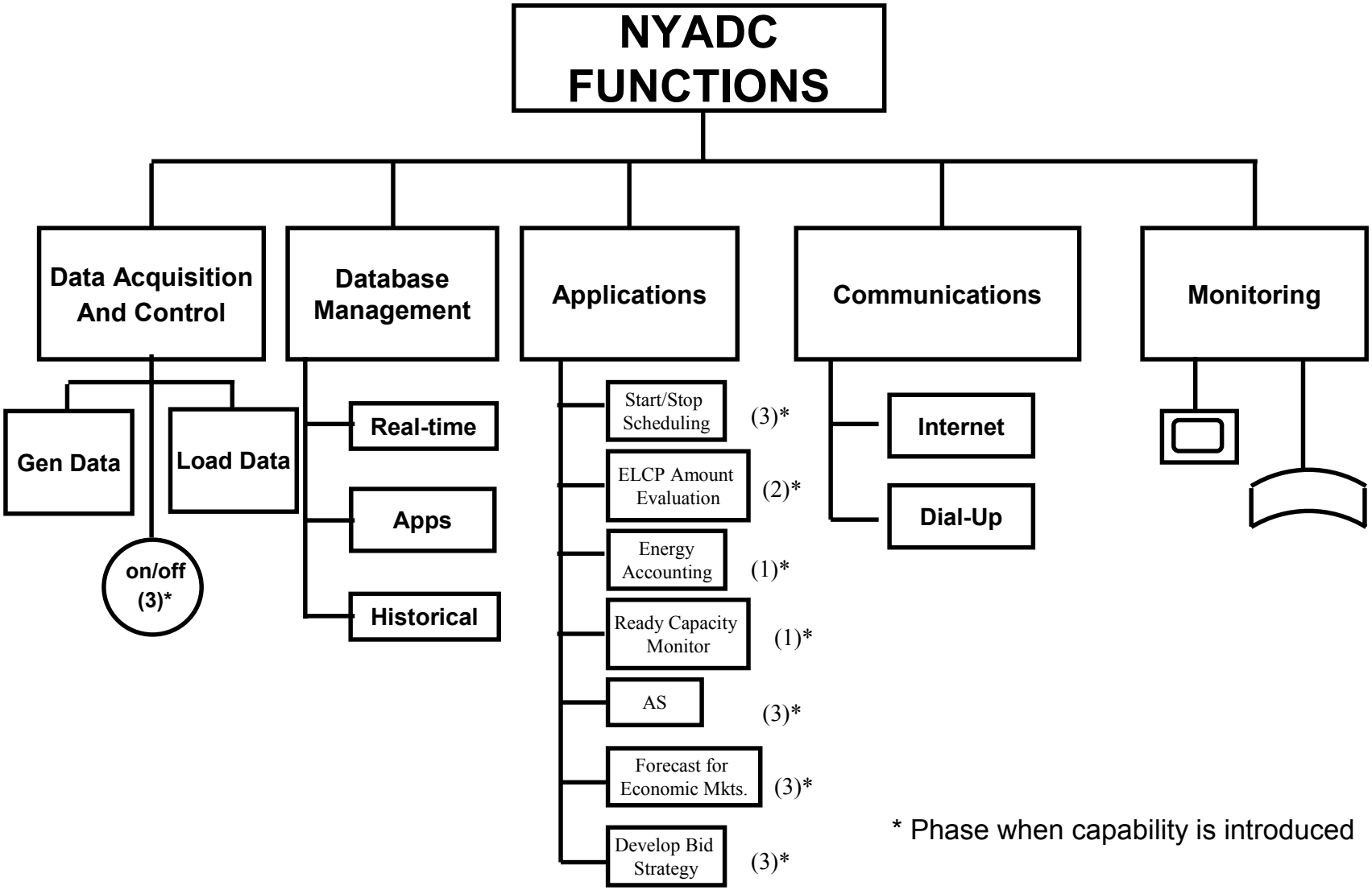
New York Aggregation Dispatch Center

Conceptual Architecture



ELECTROTEK CONCEPTS

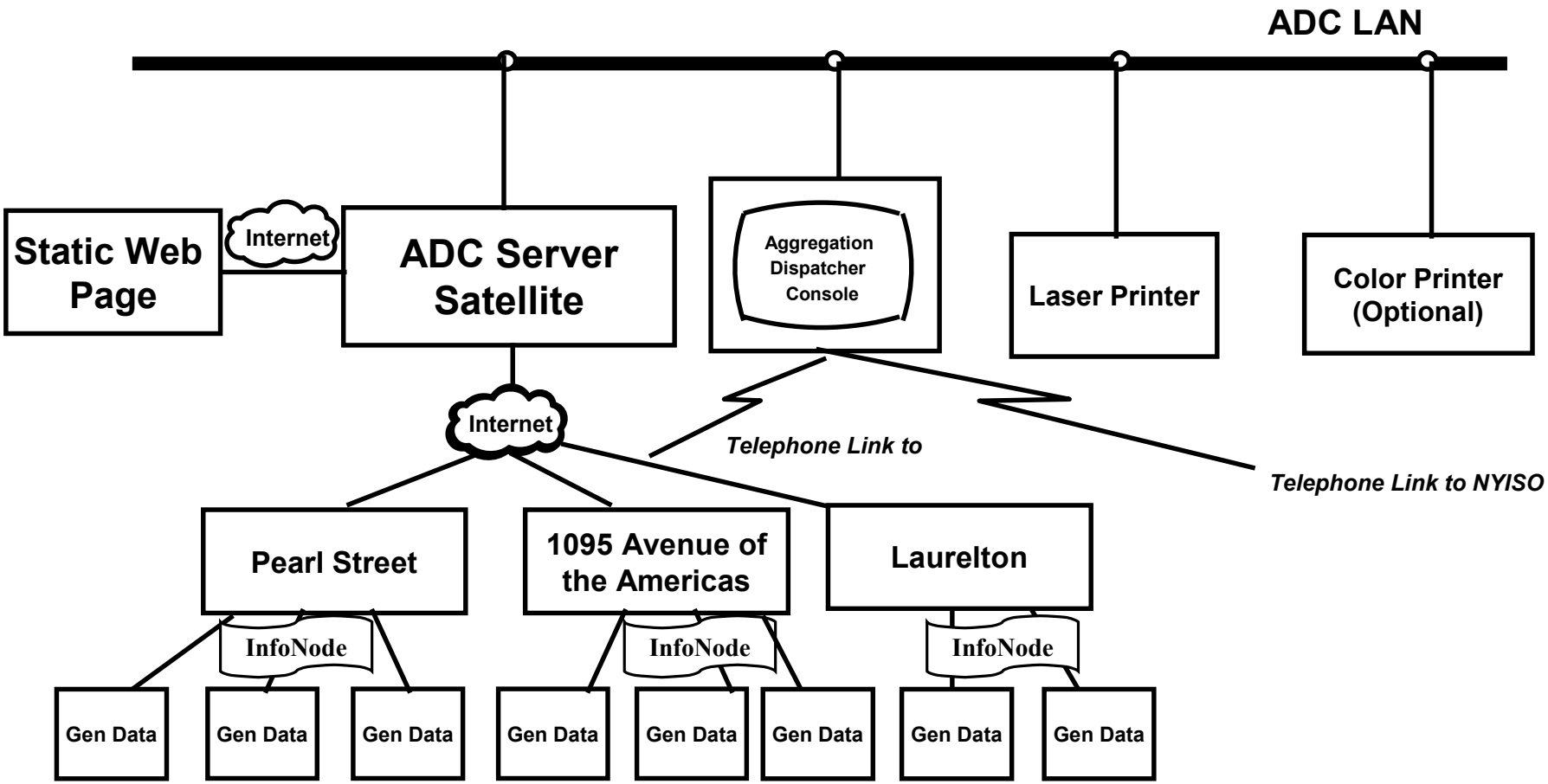
New York Satellite Aggregation Center Functional Architecture



* Phase when capability is introduced

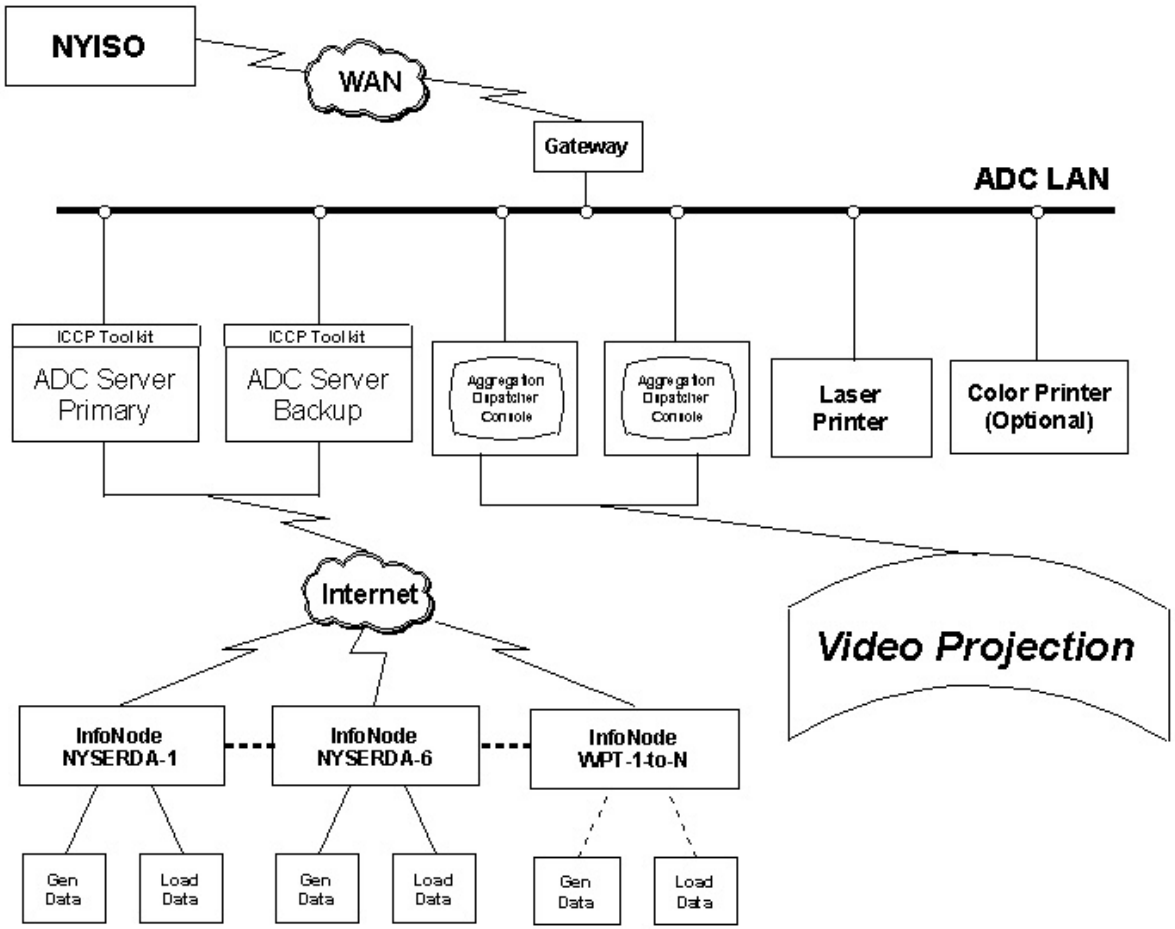
Implementation Architecture Phase One

(NYSERDA – EDRP Market)

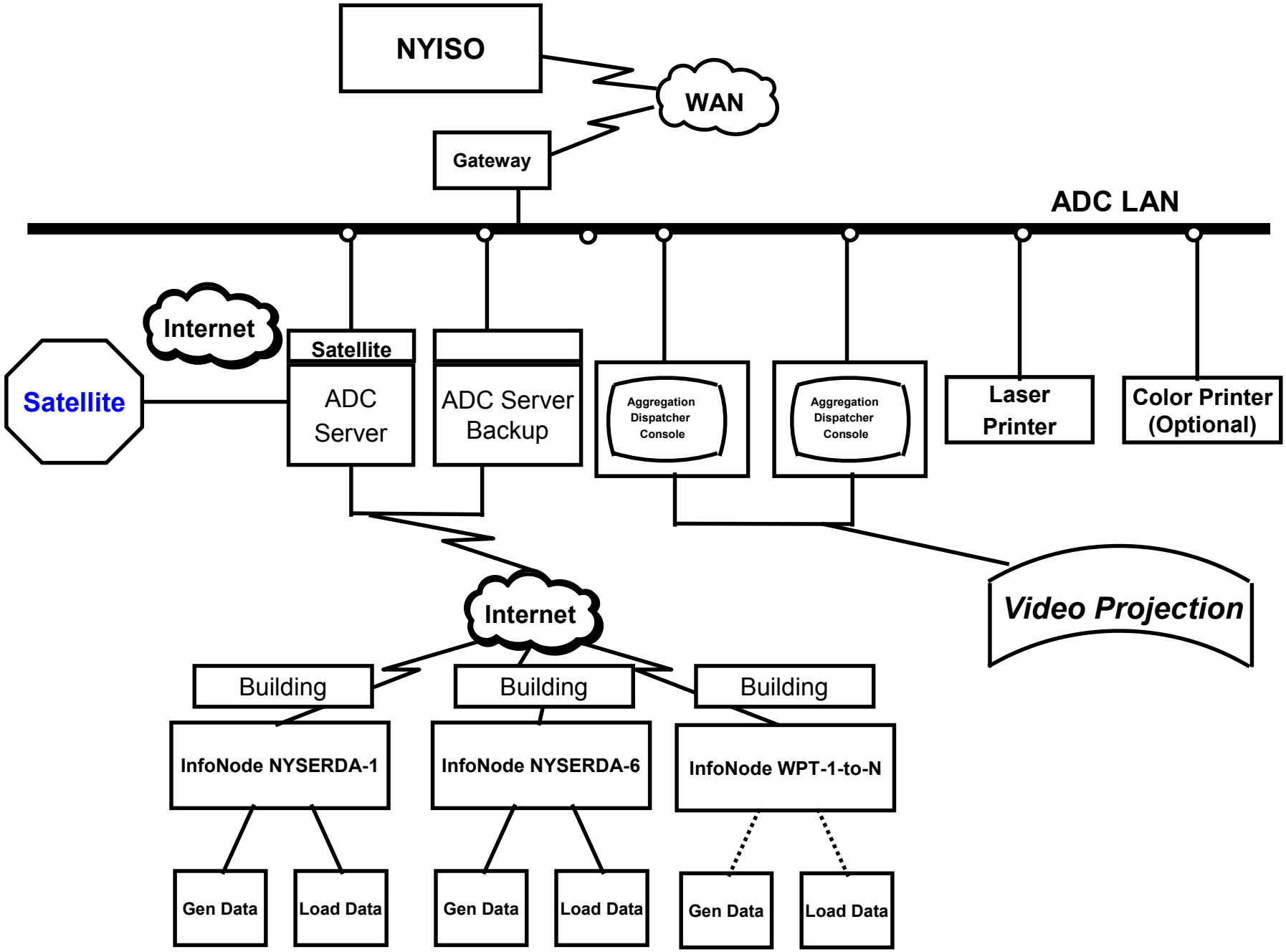


New York Aggregation Dispatch Center

Implementation Architecture Phase Two



ELECTROTEK CONCEPTS


NYISO
WAN
Gateway
ADC LAN
Internet
Satellite
Satellite
ADC Server
ADC Server Backup
Aggregation Dispatcher Console
Aggregation Dispatcher Console
Laser Printer
Color Printer (Optional)
Video Projection
Internet
Building
Building
Building
InfoNode NYSERDA-1
InfoNode NYSERDA-6
InfoNode WPT-1-to-N
Gen Data
Load Data
Gen Data
Load Data
Gen Data
Load Data

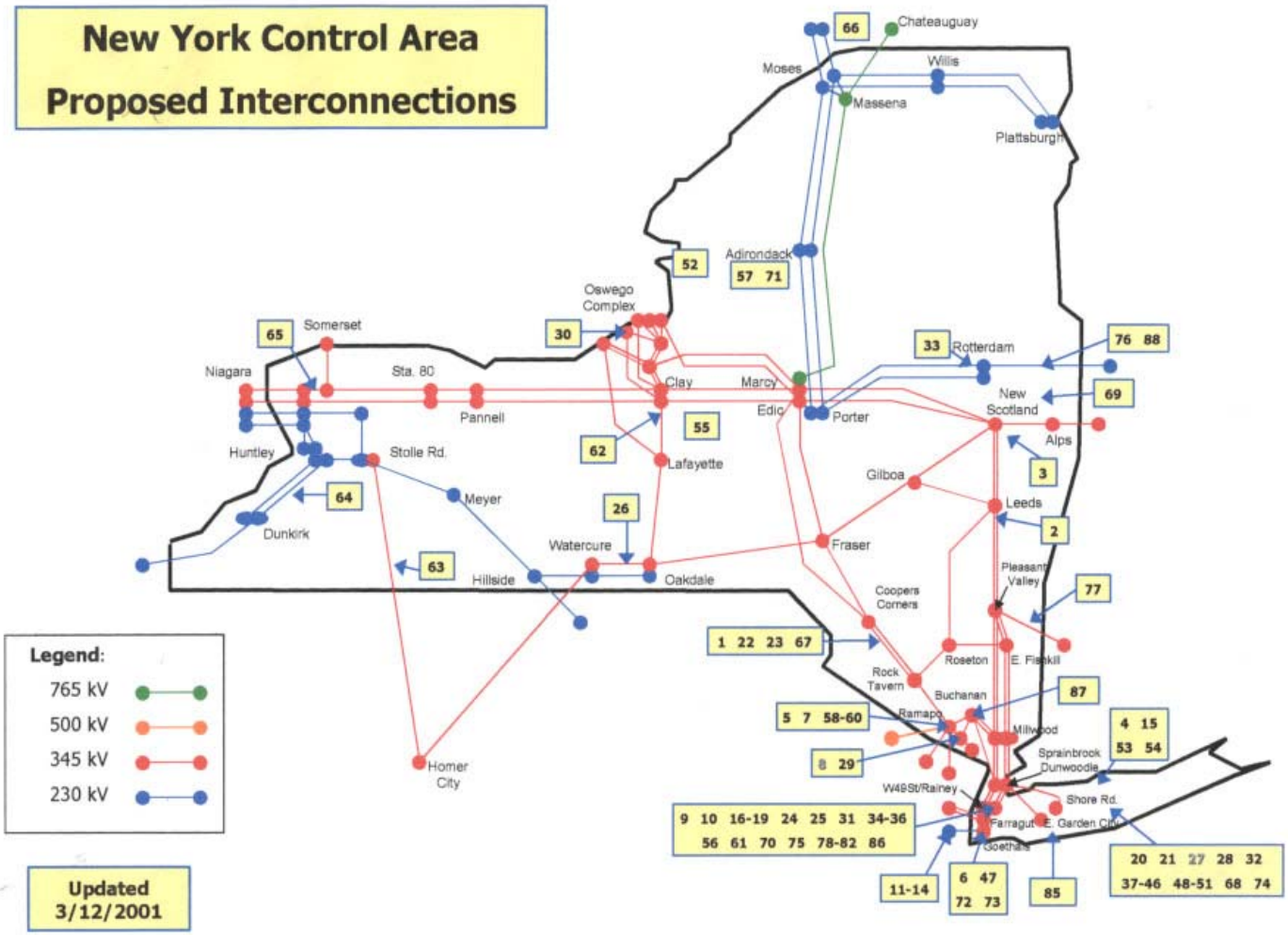
Field Test

- Freeport Electric; parallel operation within distribution planning area.
- Verizon/Brentwood; isolated/parallel operation to support distribution system.
- Brookhaven; Inter-connected operation, within BNL distribution planning area.
- Verizon/South Fork; multiple office operation to support transmission system.

Map Of Long Island

ELECTROTEK CONCEPTS

New York Transmission



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LIPA DC Cable Link

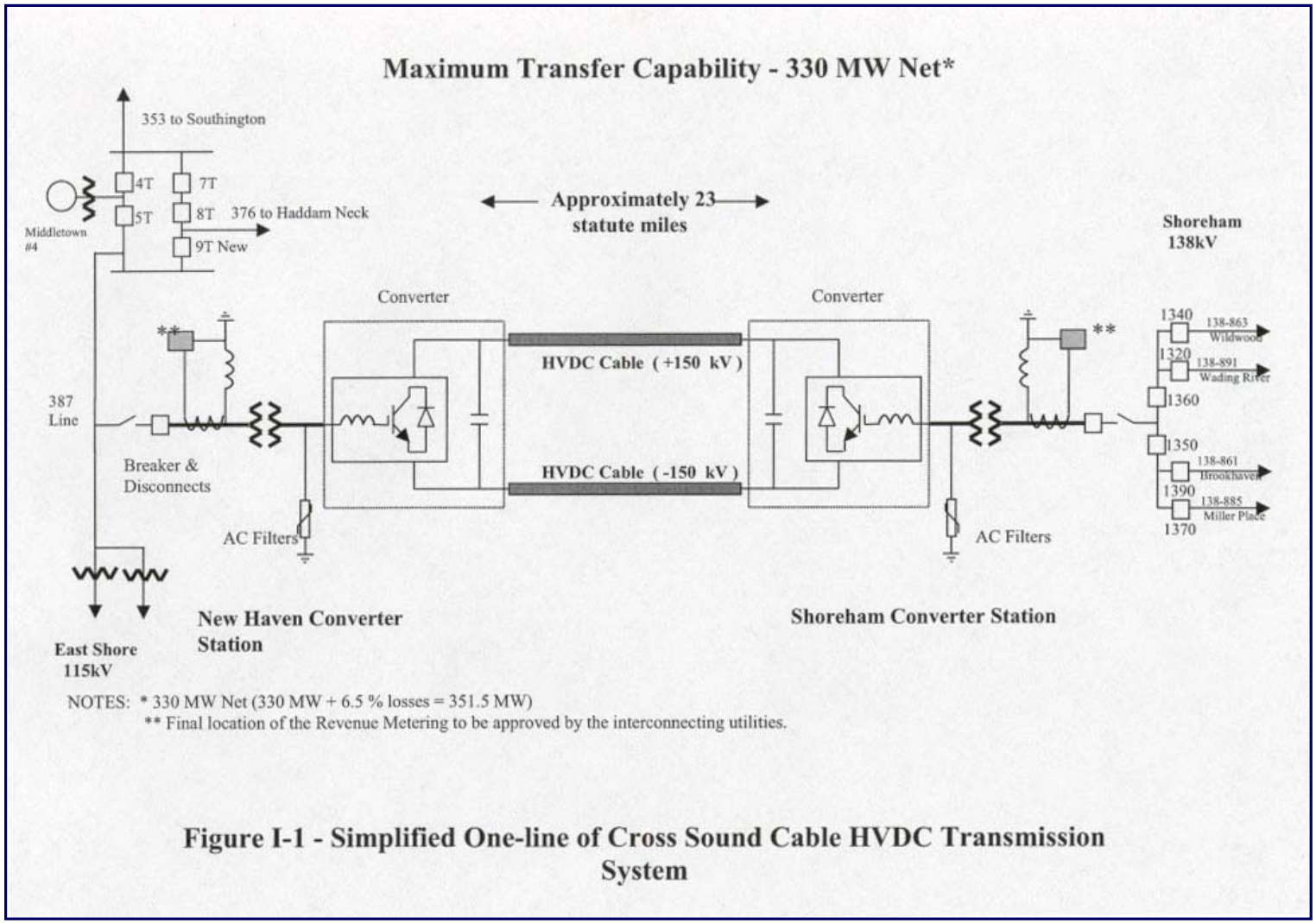
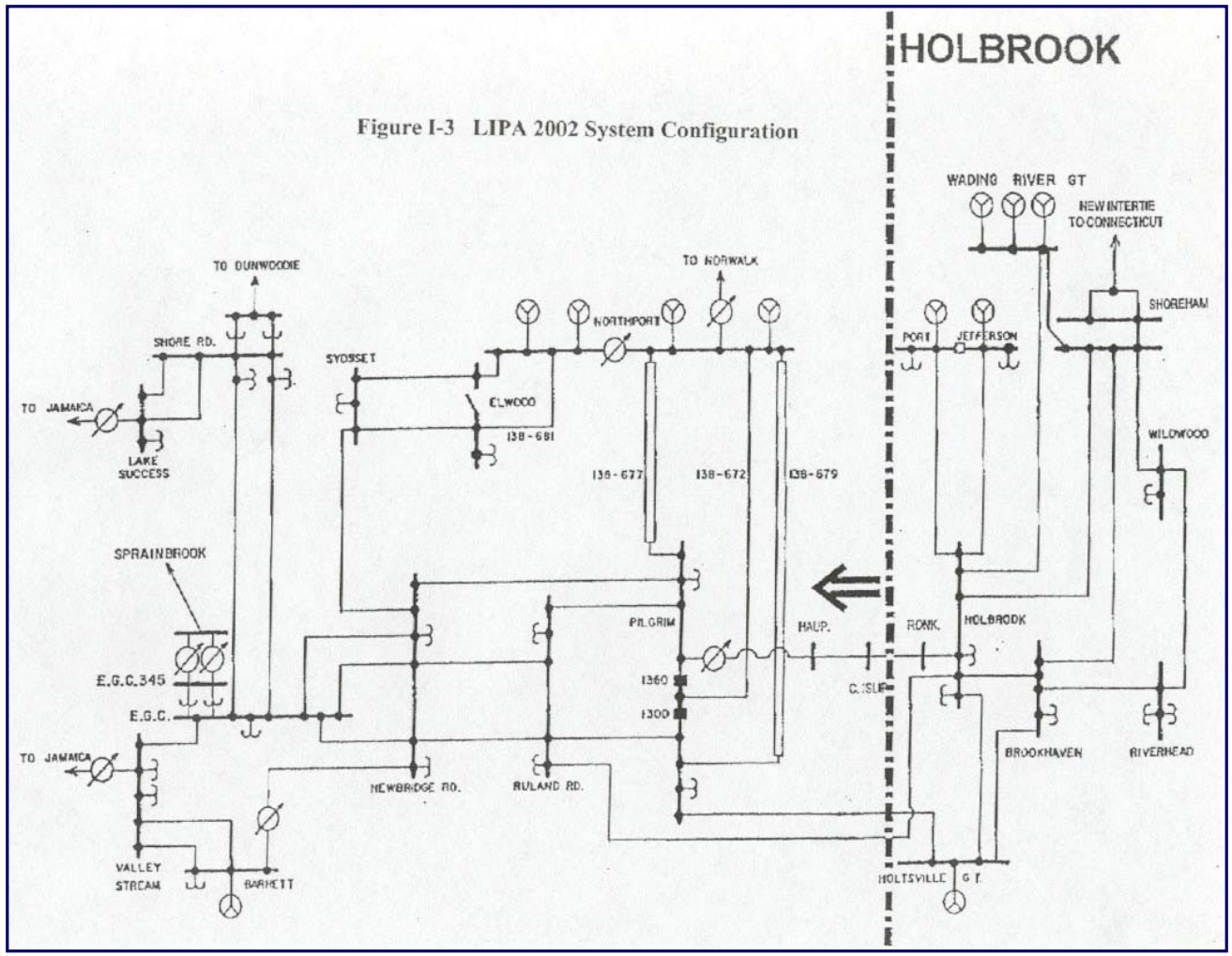


Figure I-1 - Simplified One-line of Cross Sound Cable HVDC Transmission System

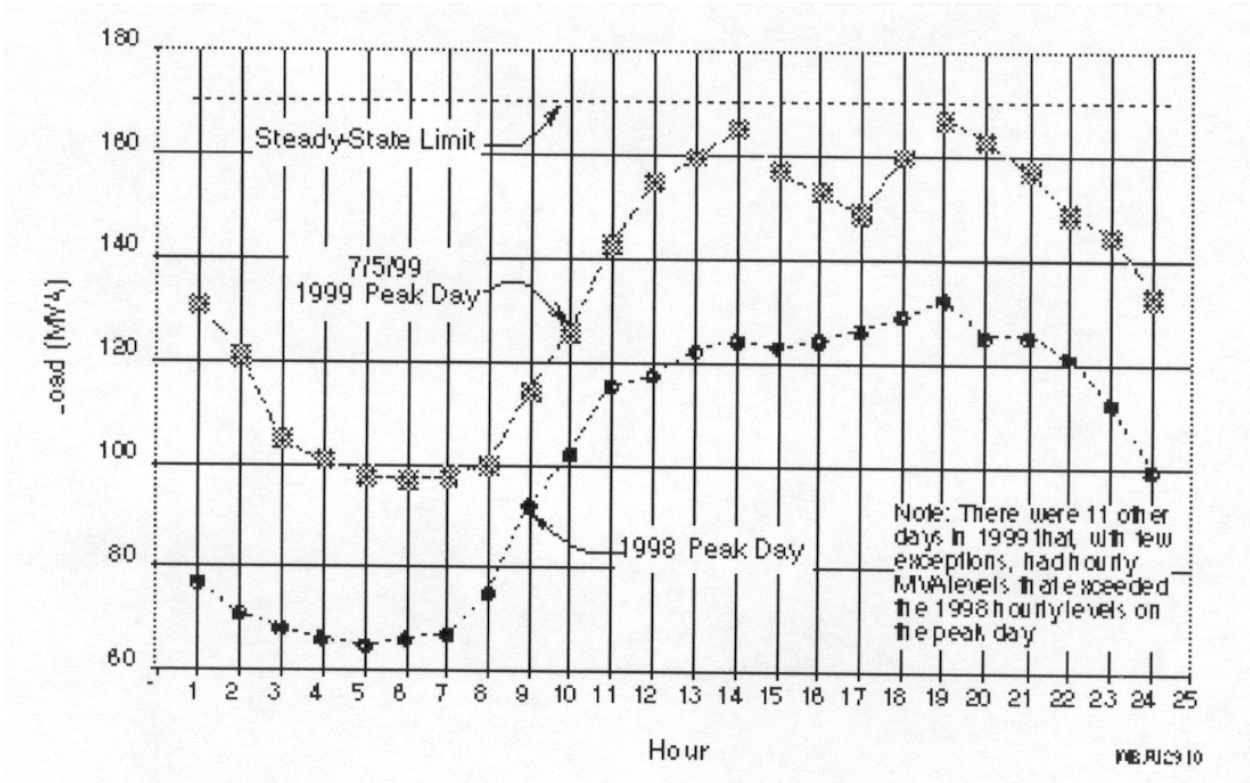
ELECTROTEK CONCEPTS

LIPA Transmission System



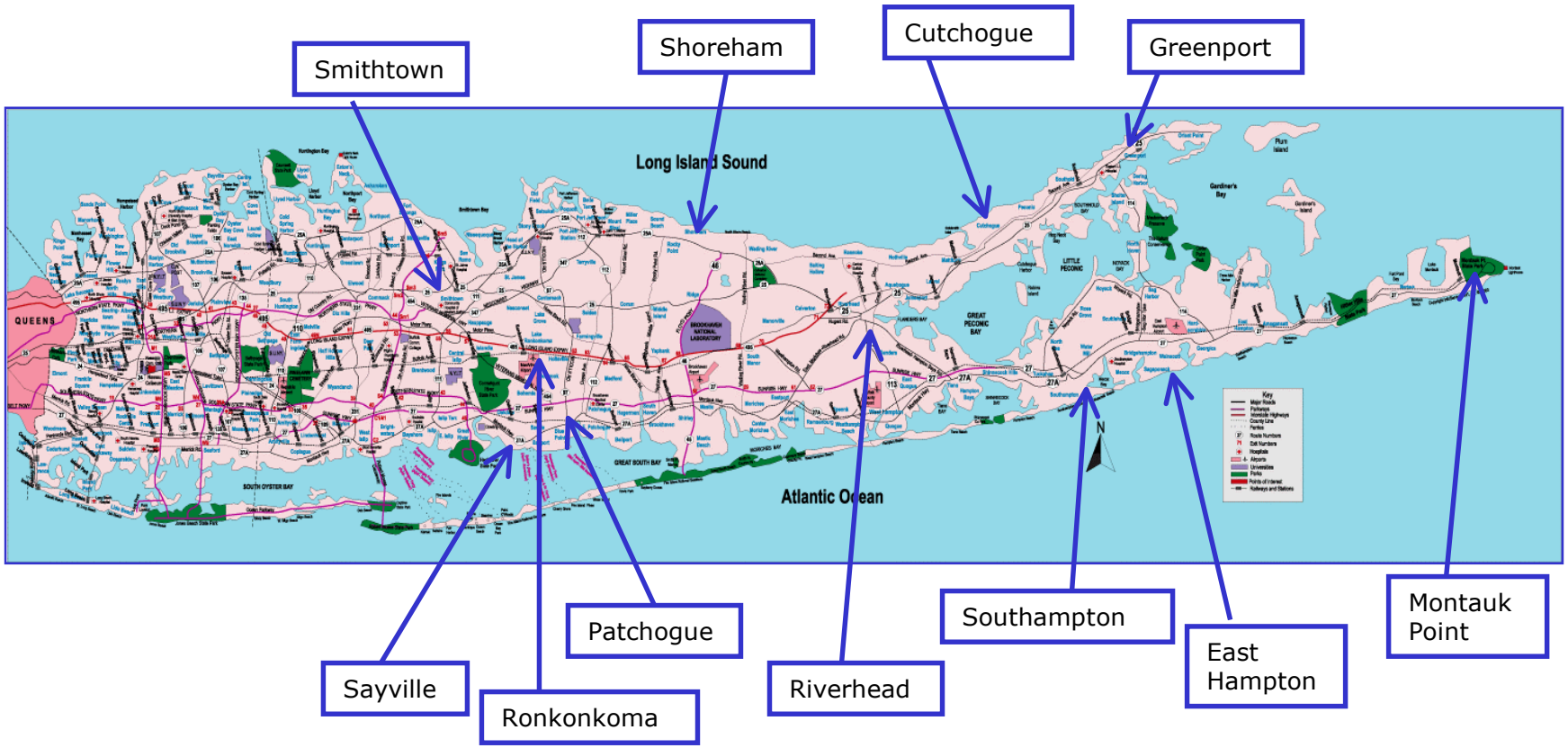
ELECTROTEK CONCEPTS

LIPA Hourly Loads in the South Fork Area



ELECTROTEK CONCEPTS

Locating Where Voltage Drop is High



ELECTROTEK CONCEPTS

Conclusions

- First Report Delivered on Time
- Work is proceeding on an expedited schedule and the remaining deliverables will be completed in August.
- Long Island is an excellent laboratory for a field test
- The operation of DG units with several types of inter-connections and as solutions to several types of problems, can be demonstrated.